

HYDROCHEMICAL CHARACTERISTICS AND WATER QUALITY INDEX OF THE MALLAYAPALLY BLOCK OF GODAVARI COAL FIELD

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Abstract

Three groundwater and three surface water samples from Mallayapally Block of Godavari Coal Field were collected and analyzed for pH, EC, TDS, TH, Ca, Mg, Na, K, HCO₃, Cl, SO₄, NO₃ and F. Water Quality Index (WQI), Sodium Adsorption Ratio (SAR) and Percent Sodium (%Na) were determined on the basis of various physico-chemical parameters in order to ascertain the suitability of water for domestic and irrigational uses. Chemical composition of the water samples were compared with the drinking water standards of World Health Organization (WHO, 2011) and Bureau of Indian Standards (BIS, 2012). Groundwater from this area was found suitable for drinking based on potassium, sulphate, nitrate and fluoride, while the concentration of calcium, magnesium, sodium, chloride and bicarbonate exceeded the maximum permissible limits at all locations. Surface water was within the permissible limits for cations and anions. WQI in the study area was found to vary from 92 to 123 in groundwater and from 43 to 64 in surface water. In groundwater samples HP 2 (104) and HP 3 (123) are of poor water quality hence found unfit for drinking, while all surface water samples are good quality water. The calculated value of SAR and %Na indicate permissible to doubtful for groundwater and 'excellent to permissible use' for surface water for irrigational purposes.

Keywords: Water quality, SAR, %Na, Water quality Index (WQI) and Mallayapally block